Rocky Flats Environmental Technology Site

Building 776/777 2nd Floor Final Survey Report

Survey Unit:
776027

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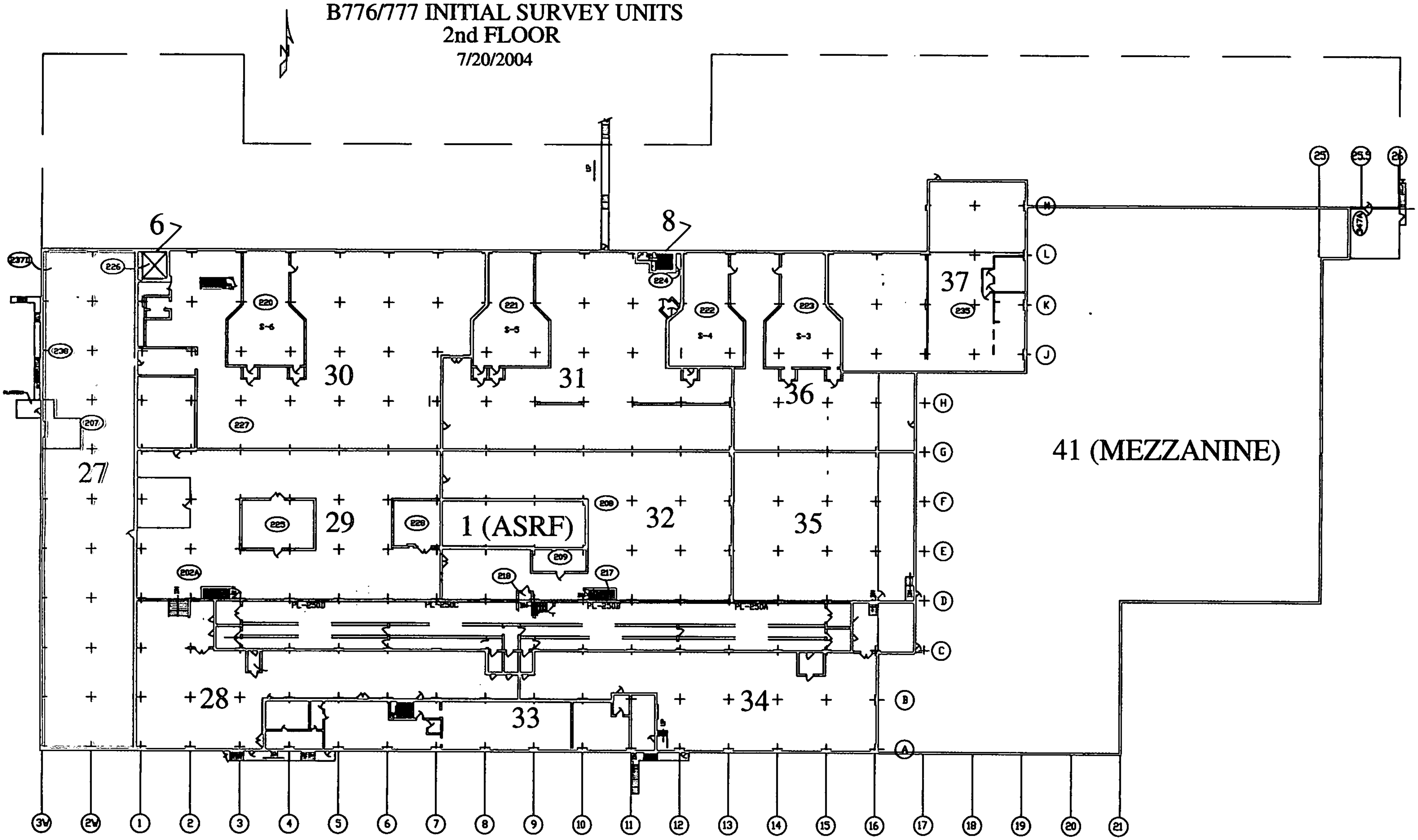
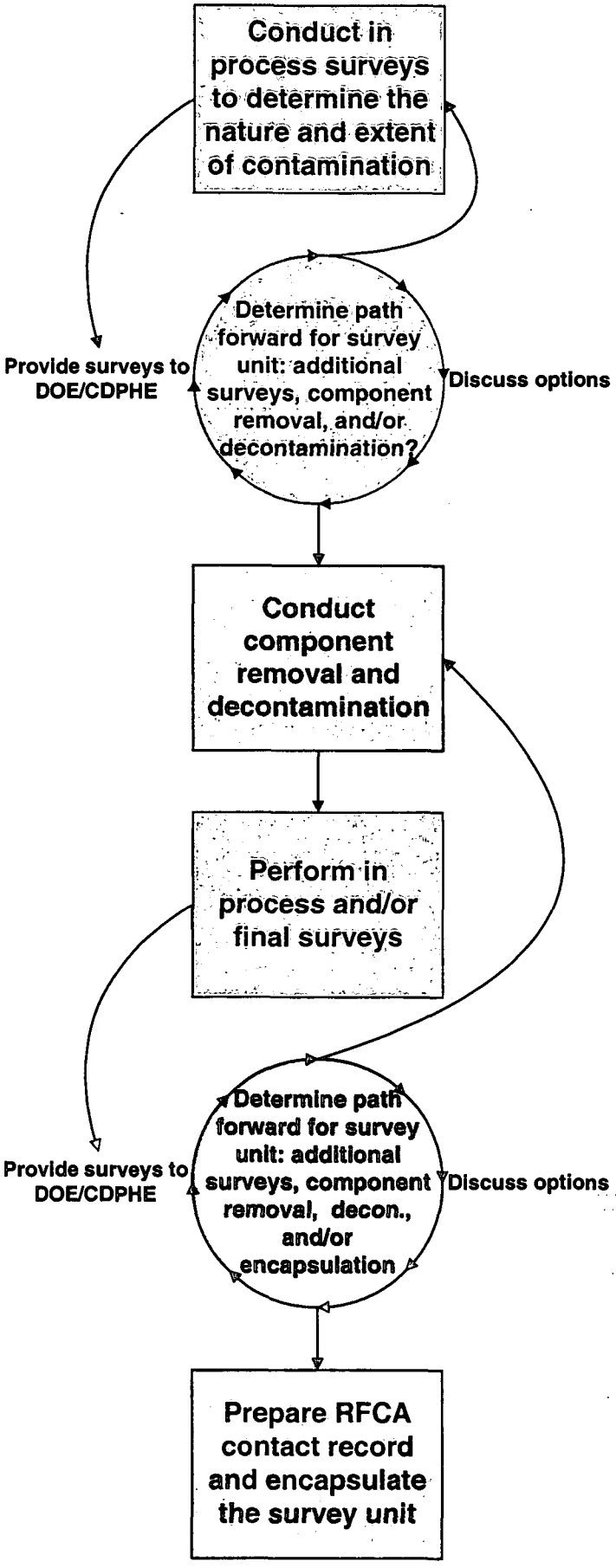
October 2004

B776/777 INITIAL SURVEY UNITS
2nd FLOOR
7/20/2004




Conduct in process surveys to determine the nature and extent of contamination
Determine path forward for survey unit: additional surveys, component removal, and/or decontamination?
Provide surveys to DOE/CDPHE
Discuss options
Conduct component removal and decontamination
Perform in process and/or final surveys
Determine path forward for survey unit: additional surveys, component removal, decon., and/or encapsulation
Provide surveys to DOE/CDPHE
Discuss options
Prepare RFCA contact record and encapsulate the survey unit

Final Survey Instructions Rev. 0 (11/8/04)
Building 776 2nd Floor
Survey Unit 776027

Purpose:

This instruction provides guidance for collecting gross gamma and removable contamination data to quantify the amount of residual contamination in Survey Unit 776027 prior to demolition. NaI measurements are performed in accordance with " INS-535-Ludlum2350-1 with Sodium Iodide Detector".

Equipment and materials:

1. A Ludlum 44-17 attached to a Ludlum 2350-1 set to collect five-minute counts that will be displayed on its LCD window.
2. A Bicron G-5 attached to a Ludlum 2350-1 set to collect five-minute counts that will be displayed on its LCD window.
3. One Electra with attached DP-6, calibrated and daily response checked.
4. Two probe holders, one for the G-5 and one for the 44-17 with tin shielding.
5. Calibrated and daily response checked SAC-4.
6. Measuring tape or laser range finder.

Note: The NE Electra with DP-6 probe and the Eberline SAC-4 shall be used in accordance with RSP- 7.01 and 7.02

Procedure:

1. Inspect instrument for obvious damage and ensure battery voltage is equal to or greater than 4.6 volts. If battery voltage is less than 4.6 volts change the batteries.
2. Complete daily performance checks for Sodium Iodide detectors to ensure the instrument is functioning properly by using Americium-241 source TS-912. Record results on Sodium Iodide Data Sheet.
3. For floor and concrete wall background measurements, perform a 300-second background count with a Bicron G-5 for floors or Ludlum 44-17 for walls at background location in room 201A near column B-13. Record background counts next to "Bkg Floor" or "Bkg Concrete Wall"in background column of attached "Sodium Iodide Data Collection" sheets as needed.
4. For block wall background measurements, perform a 300-second background count with a Ludlum 44-17 at background location on the outside of the east wall of room 219. Record background counts next to "Bkg Block Wall" in background column of attached Sodium Iodide data collection sheets as needed.
5. For ceiling background measurements, perform a 300-second background count with a Ludlum 44-17 at background location in room 201A near column B-13. Hold the probe waist high, pointed toward ceiling using a sheet metal plate in front of the detector (take background measurement in this configuration). Record background counts next to "Bkg Metal Ceiling" in background column of attached Sodium Iodide data collection sheets as needed.
6. Mark the sample locations on the surfaces to be measured. Take all measurements on contact with the marked surface using tin side shields on the Bicron G-5 and tin side and back shields on the Ludlum 44-17. All Sodium Iodide readings shall have 300 second count times.
7. Collect sodium Iodide, total surface activity and removable surface activity measurements at all locations marked on the attached map.
8. Record the NaI and NE Electra measurements on the attached sheet. Note any items or conditions that may have affected the measurement in the "remarks" section.
9. Count swipes for 60 seconds with a SAC-4, record result on attached sheet for removable contamination.

Table 776027-1: Survey Requirements				
Surface	**Type of Survey**	**Probe**	**Placement**	**Count Time**
Floor	Total Alpha Activity	Bicron G-5	On contact	300 seconds
All Surfaces	Total Alpha Activity	Electra with DP-6	On contact	60 seconds
Block walls	Total Alpha Activity	Bicron G-5 or Ludlum 44-17	On contact	300 seconds
All Surfaces	Removable Alpha	SAC-4	Swipe placed in tray	60 seconds
Ceiling	Total Alpha Activity	Ludlum 44-17	On Contact	300 seconds
Block Walls	Background measurement	Bicron G-5 or Ludlum 44-17	On contact with outside east wall of room 219	300 seconds
Floors and cement walls	Background measurement	Bicron G-5 or Ludlum 44-17	On contact with floor in room 201A near column B-13	300 seconds
Metal ceilings	Background measurement	Ludlum 44-17	Probe waist high, pointed toward ceiling with sheet metal plate on end in room 201A near column B-13	300 seconds

Final Survey for Survey Unit 776027

FINAL SURVEY REPORT
Survey Unit 776027

1) Introduction and Scope

A pre-demolition radiological survey (PDS) is performed prior to building demolition to define the radiological conditions of a facility. A PDS survey for survey unit 776027 has been completed in accordance with guidelines outlined in the "Radiological Pre-Demolition Survey Plan Building 776/777". Based on the results it is recommended that no further remediation is needed, and that the survey unit may be encapsulated in preparation for demolition. Isolation controls shall be put in place to prevent recontamination of the area. This report has been prepared in accordance with sections 3 and 8 of the "Radiological Pre-Demolition Survey Plan Building 776/777".

Survey unit 776027 is part of the original building and is located in the west side of the second floor of building 776 and includes the floors, walls and ceiling of rooms 237, 237B, 237C, 237D, and 238. The S-9 Plenum is also included with this unit. Survey unit 776027 is bounded by column lines 1-3W and A-L.

2) PDS Methods and Techniques

The PDS survey results determine the Average Surface Contamination Value ($ASCV_u$) and source term for the survey unit. These parameters are used determine whether the building may be demolished within the limits outlined in the "Radiological Pre-Demolition Survey Plan Building 776/777".

To obtain a statistically powerful number of data points, a minimum of 30 survey points were selected per survey unit. A random start, systematic grid method was used to identify the survey point locations. Three types of surveys are performed at each survey point as follows:

a) Painted surfaces are evaluated for potential contamination under coatings using sodium iodide (NaI) gamma detectors attached to a single channel analyzer windowed for the 59 keV gamma-ray (Am^{241}).
b) Direct alpha surface contamination measurements are performed using a NE Electra survey instrument with attached DP-6 probe. This data may be compared to the NaI survey data to show the fraction of contamination that is directly on the surface verses imbedded in the material matrix.
c) Removable surface alpha contamination surveys were performed by swiping the survey point with a 47mm filter paper then counting the filter paper on a SAC-4 alpha counter. This data may be used to gauge the effectiveness of encapsulation following the PDS.

To conservatively determine the final Average Surface Contamination Value ($ASCV_u$) for the survey unit, the source term associated with inaccessible areas of the survey unit (as described in section 4 of this report) is added to the source term calculated by the PDS survey.

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3) ALARA Post Remediation Surveys

In addition to the PDS used to determine the Average Surface Contamination Value ($ASCV_u$) and source term for the survey unit, surveys were taken to determine the effectiveness of remediation efforts. Remediation is performed to demonstrate a reasonable best effort is made to maintain releases to the environment and doses to the workers ALARA. Remediation may include decontamination, or removal of parts of the structure such as block wall removal.

a) Floors

The floors of survey unit 776027 consist of paint covered concrete. Measurements collected on the floor of 776027 show that the approximately 50% of the floor has activity below levels that were near the MDA of the sodium iodide instruments. Survey grids 27-9, 27-20, 27-21, 27-29, and 27-50 through 27-55 indicated elevated activities during the in-process characterization survey and were shaved before being re-surveyed. Only one grid (27-51) averaged over 100,000 dpm/100cm^2 on follow-up contact survey readings. Remediation of the elevated floor areas resulted in a decontamination factor (DF) of 8.5, or a source term reduction of 88%.

Table 1:
Floor Remediation Results

	Pre-Remediation (In-process)	Post-Remediation (Follow-up)
Maximum (dpm/100cm^2)	16,100,470	162,608
Minimum (dpm/100cm^2)	15,664	6,782
Average (dpm/100cm^2)	352,143	40,976
Average (μCi/m^2)	15.9	1.86
Source Term (μCi)	11,883	1,395

b) Walls

Walls of survey unit 776027 were surveyed during the in process characterization using a 3 foot wide by 3 foot high grid system. No remediation was performed based on the in-process data.

The following table was compiled using the in-process survey values reported for in the wall section of the In-Process Survey Report for survey unit 776027:

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Table 2:
Wall Remediation Results

	Pre-Remediation (In-process)	Post-Remediation
Maximum (dpm/100cm^2) Wall Section Average	8,326	8,326
Minimum (dpm/100cm^2) Wall Section Average	2,549	2,549
Average (dpm/100cm^2) Wall Section Average	4,272	4,272
Average (μCi/m^2)	0.19	0.19
Source Term (μCi)	60	60

c) **Ceilings**

No ceiling survey points were determined to require remediation during the in-process characterization of survey unit 776027.

Some portions of the ceiling were completely blocked by piping and supply ductwork and were not surveyed with sodium iodide probes during the in-process survey. No follow up sodium iodide readings were taken in the blocked areas. Nearby accessible sodium iodide readings indicated that the blocked areas had no more potential for being contaminated than the accessible areas.

Table 3:
Ceiling Remediation Results

	Pre-Remediation (In-process)	Post-Remediation
Maximum (dpm/100cm^2)	34,112	34,112
Minimum (dpm/100cm^2)	9,165	9,165
Average (dpm/100cm^2)	10,453	10,453
Average (μCi/m^2)	0.47	0.47
Source Term (μCi)	351	351

4) **Inaccessible Areas**

a) **Floors**

One inaccessible area was identified on the floor of survey unit 776027 located in survey grids 27-51, 27-52 and 27-54. The 16' long east-west seam was found to be contaminated at levels between 1.3E6 to 6.5E7 dpm/100 cm^2, averaging 3.4E7 dpm/100 cm^2. Most of the contaminated material was removed and readings in the seam were significantly reduced to levels between 1.8E4 to 4.0E5 dpm/100 cm^2 averaging 2.1E5 dpm/100 cm^2. This area is approximately 16 feet (4.9 m) long by 4 inches (0.1m) wide. The amount of activity remaining in the area is estimated as:

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0.5 m^2 * 2.1E5 dpm/100 cm^2*μCi-1E4 cm^2/2.22E6 dpm-m^2= **4.7 μCi.**

The amount of source term *removed* from the seam is conservatively estimated as:

0.5 m^2 * (3.4E7-2.1E5) dpm/100 cm^2*μCi-1E4 cm^2/2.22E6 dpm-m^2= **761 μCi.**

Table 4:
Grids 27-51, 27-52, and 27-54 Floor Crack Remediation Results

	Pre-Remediation (In-process)	Post-Remediation
Maximum (dpm/100cm^2)	65, 961,806	395,388
Minimum (dpm/100cm^2)	1,390,657	18,828
Average (dpm/100cm^2)	33,676,232	207,108
Average (μCi/m^2)	1531.4	9.4
Source Term (μCi)	765.7	4.7

An elevated area was identified between footer left after transite wall was removed and the block wall running north to south along columns J-1 to G-1. The readings ranged from 2.3E5 to 1.6E6 dpm/100 cm^2 and averaging about 6.8E5 dpm/100 cm^2. This area is approximately 40 feet (12.0 m) long by 4 inches (0.10m) wide. The amount of activity remaining in the area is estimated as:

1.2 m^2 * 6.5E5 dpm/100 cm^2*μCi-1E4 cm^2/2.22E6 dpm-m^2= **36.9 μCi.**

b) Walls

No inaccessible areas with elevated contamination levels were identified during the in process surveys that would not have the same contamination potential as adjacent accessible areas measured.

c) Ceilings

No inaccessible areas with elevated contamination levels were identified during the in process surveys that would not have the same contamination potential as adjacent accessible areas measured.

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5.) PDS Survey Results Summary

The values for the accessible areas and inaccessible areas were summed and divided by the total area for the survey unit to calculate the "Average Surface Contamination Value" ($ASCV_u$) and source term for the survey unit. The results are summarized in Table 5 below:

Table 5:
PDS Final Results

	Final Results
776027 Source Term Inaccessible Areas (μCi)	41.6
776027 Source Term Accessible Areas (μCi)	887.6
776027 Total Source Term (μCi)	929.2
Survey Unit Area (m^2)	1936
$ASCV_u$ ($\mu Ci/m^2$)	0.48
$ASCV_u$ ($dpm/100cm^2$)	10,655

Table 5 Notes:

a) Inaccessible areas source term is summed from areas discussed in Section 4 of this report.

b) Accessible area source term is the average contamination value from the PDS survey applied to the total accessible surface area of the survey unit (1936 m^2).

c) Total Source Term equals the sums of the source terms of Inaccessible Area + Accessible Area.
Total Source Term = (41.6 + 887.6) μCi = 929.2 μCi

d) Average Surface Contamination for the Survey Unit ($ASCV_u$) in $dpm/100cm^2$ equals:
$ASCV_u$ = (929.2 μCi)(22,200 $dpm/100cm^2$ / 1 $\mu Ci/m^2$) / (1,936 m^2)= 10,655 $dpm/100cm^2$

Survey Unit 776027 Summary

Total Surface Activity Measurements

30	30	
Number Required	Number Obtained	
MIN	3,351	dpm/100 cm^2
MAX	53,660	dpm/100 cm^2
Average	10,178	dpm/100 cm^2
STD DEV	12,237	dpm/100 cm^2

Total Surface Area	1936	m^2
Inaccessible Areas	41.6	µCi, Alpha
Accessible Surfaces	887.6	µCi, Alpha

Total Inventory	929.2	µCi, Alpha
$ASCV_u$	10,655	dpm/100cm^2
$ASCV_u$	0.48	µCi per m^2

776027 Followup Survey Results

Location #	E/W Column letter	N/S Column Number	DistanceNorth (ft)	Distance East (ft)	Elevation	dpm/100cm2 PRE REMEDIATION	dpm/100cm2 POST REMEDIATION
27-1	K	3W	14	5	Floor	16,022	16,022
27-2	K	3W	11	19	Floor	57,430	57,430
27-3	K	2W	19	9	Floor	53,409	53,409
27-4	K	2W	16	16	Floor	54,454	54,454
27-5	K	2W	5	16	Floor	26,785	26,785
27-6	K	2W	5	7	Floor	16,022	16,022
27-7	K	3W	6	16	Floor	74,161	74,161
27-8	K	3W	9	1	Floor	16,022	16,022
27-9	J	3W	2	3	Floor	141,324	61,985
27-9A	J	3W	5	6	Floor	76,091	76,091
27-10	J	3W	18	15	Floor	24,935	24,935
27-11	J	2W	12	7	Floor	85,261	85,261
27-11A	J	2W	16	6	Floor	28,152	28,152
27-12	J	2W	13	19	Floor	133,120	22,714
27-12A	J	2W	15	15	Floor	24,613	24,613
27-13	J	2W	3	19	Floor	138,589	26,121
27-13A	J	2W	5	15	Floor	53,167	53,167
27-14	J	2W	6	6	Floor	116,309	69,716
27-14A	J	2W	1	1	Floor	27,830	27,830
27-15	J	3W	6	18	Floor	36,437	36,437
27-16	J	3W	5	5	Floor	16,022	16,022
27-17	H	3W	17	2	Floor	19,707	19,707
27-18	H	3W	14	16	Floor	43,676	43,676
27-19	H	2W	19	19	Floor	50,030	50,030
27-20	H	2W	16	19	Floor	666,483	35,762
27-20A	H	2W	15	14	Floor	55,017	55,017
27-21	H	2W	9	19	Floor	347,559	36,531
27-21A	H	2W	5	15	Floor	62,176	62,176
27-22	H	2W	5	5	Floor	102,072	28,014
27-23	H	3W	4	18	Floor	27,348	27,348
27-24	H	3W	5	5	Floor	31,450	31,450
27-25	G	3W	13	7	Floor	48,180	48,180
27-26	G	3W	19	19	Floor	46,170	46,170
27-27	G	2W	13	2	Floor	98,935	98,935
27-28	G	2W	16	19	Floor	586,048	59,529
27-28A	G	2W	13	13	Floor	59,522	59,522
27-29	G	2W	6	19	Floor	325,359	41,419
27-29A	G	2W	5	14	Floor	36,759	36,759
27-30	G	2W	8	2	Floor	87,835	87,835
27-31	G	3W	5	17	Floor	35,874	35,874

776027 Followup Survey Results

Location #	E/W Column letter	N/S Column Number	DistanceNorth (ft)	Distance East (ft)	Elevation	dpm/100cm2 PRE REMEDIATION	dpm/100cm2 POST REMEDIATION
27-32	G	3W	1	2	Floor	30,404	30,404
27-33	F	3W	14	5	Floor	56,948	56,948
27-34	F	3W	15	16	Floor	47,537	47,537
27-35	F	2W	15	3	Floor	87,111	87,111
27-36	F	2W	19	19	Floor	474,324	10,694
27-36A	F	2W	15	15	Floor	48,341	48,341
27-37	F	2W	5	15	Floor	15,664	15,664
27-38	F	2W	4	5	Floor	41,424	41,424
27-39	F	3W	5	15	Floor	84,859	84,859
27-40	F	3W	7	1	Floor	85,743	85,743
27-41	E	3W	11	1	Floor	62,659	62,659
27-42	E	3W	15	15	Floor	61,935	61,935
27-43	E	2W	15	5	Floor	34,185	34,185
27-44	E	2W	14	11	Floor	96,280	96,280
27-44A	E	2W	13	14	Floor	22,441	22,441
27-44*	E	2W	14	11	Floor	1,312,937	62,939
27-45	E	2W	9	19	Floor	35,874	35,874
27-46	E	2W	5	5	Floor	19,465	19,465
27-47	E	3W	7	16	Floor	27,348	27,348
27-48	E	3W	6	6	Floor	41,424	41,424
27-49	D	3W	13	1	Floor	63,624	63,624
27-50	D	3W	11	18	Floor	160,789	35,677
27-50A	D	3W	16	13	Floor	44,239	44,239
27-51	D	2W	12	9	Floor	5,694,139	143,390
27-51A	D	2W	17	2	Floor	345,307	162,608
27-52	D	2W	15	15	Floor	16,100,470	29,671
27-52A	D	2W	19	15	Floor	129,661	6,782
27-52B	D	2W	11	16	Floor	NA	50,321
27-53	D	2W	8	14	Floor	2,455,513	30,452
27-53A	D	2W	5	15	Floor	115,424	12,871
27-54	D	2W	6	1	Floor	1,069,943	37,450
27-54A	D	2W	6	7	Floor	91,776	6,782
27-55	D	3W	6	17	Floor	966,022	90,193
27-55A	D	3W	3	13	Floor	15,664	15,664
27-56	D	3W	5	6	Floor	29,841	29,841
27-57	C	3W	15	5	Floor	25,980	25,980
27-58	C	3W	15	15	Floor	17,696	17,696
27-59	C	2W	15	5	Floor	31,048	31,048
27-60	C	2W	16	16	Floor	15,713	15,713
27-61	C	2W	5	14	Floor	15,713	15,713

776027 Followup Survey Results

Location #	E/W Column letter	N/S Column Number	DistanceNorth (ft)	Distance East (ft)	Elevation	dpm/100cm2 PRE REMEDIATION	dpm/100cm2 POST REMEDIATION
27-62	C	2W	5	5	Floor	26,302	26,302
27-63	C	3W	7	19	Floor	35,472	35,472
27-64	C	3W	3	7	Floor	23,326	23,326
27-65	B	3W	15	6	Floor	15,713	15,713
27-66	B	3W	18	16	Floor	33,139	33,139
27-67	B	2W	14	5	Floor	38,528	38,528
27-68	B	2W	14	14	Floor	32,013	32,013
27-69	B	2W	7	13	Floor	30,324	30,324
27-70	B	2W	8	3	Floor	56,787	56,787
27-71	B	3W	5	15	Floor	30,083	30,083
27-72	B	3W	5	5	Floor	32,496	32,496
27-73	A	3W	15	5	Floor	20,591	20,591
27-74	A	3W	17	11	Floor	17,937	17,937
27-75	A	2W	13	5	Floor	15,954	15,954
27-76	A	2W	11	13	Floor	15,713	15,713
27-77	A	2W	8	14	Floor	15,954	15,954
27-78	A	2W	7	6	Floor	15,954	15,954
27-79	A	3W	6	16	Floor	15,954	15,954
27-80	A	3W	6	2	Floor	15,954	15,954
27-81	Above PLENUM						
27-82	K	3W	12	18	Ceiling	9,165	9,165
27-83	K	2W	16	5	Ceiling	9,165	9,165
27-84	K	2W	17	13	Ceiling	9,952	9,952
27-84A	K	2W	17	14	Ceiling	9,165	9,165
27-85	K	2W	5	17	Ceiling	9,952	9,952
27-85A	K	2W	6	16	Ceiling	9,165	9,165
27-86	K	2W	8	6	Ceiling	9,165	9,165
27-87	K	3W	3	18	Ceiling	9,165	9,165
27-88	Above PLENUM						
27-89	Above PLENUM						
27-90	J	3W	15	17	Ceiling	9,165	9,165
27-91	J	2W	17	18	Ceiling	9,165	9,165
27-92	J	2W	16	15	Ceiling	9,952	9,952
27-92A	J	2W	16	16	Ceiling	9,165	9,165
27-93	J	2W	6	15	Ceiling	9,952	9,952
27-93A	J	2W	5	15	Ceiling	9,205	9,205
27-94	J	2W	8	6	Ceiling	9,165	9,165
27-95	J	3W	4	17	Ceiling	9,165	9,165
27-96	Above PLENUM						
27-97	Above PLENUM						

776027 Followup Survey Results

Location #	E/W Column letter	N/S Column Number	DistanceNorth (ft)	Distance East (ft)	Elevation	dpm/100cm2 PRE REMEDIATION	dpm/100cm2 POST REMEDIATION
27-98	H	3W	13	18	Ceiling	9,165	9,165
27-99	H	2W	15	5	Ceiling	9,165	9,165
27-100	H	2W	17	15	Ceiling	9,952	9,952
27-100A	H	2W	17	16	Ceiling	9,165	9,165
27-101	H	2W	5	15	Ceiling	9,952	9,952
27-101A	H	2W	2	7	Ceiling	14,620	14,620
27-102	H	2W	2	3	Ceiling	9,670	9,670
27-103	H	3W	2	8	Ceiling	9,670	9,670
27-104	H	3W	3	1	Ceiling	9,670	9,670
27-105	G	3W	8	2	Ceiling	9,670	9,670
27-106	G	3W	7	9	Ceiling	12,454	12,454
27-107	G	2W	7	3	Ceiling	9,670	9,670
27-108	G	2W	15	15	Ceiling	9,952	9,952
27-108A	G	2W	7	8	Ceiling	17,868	17,868
27-109	G	2W	7	15	Ceiling	9,952	9,952
27-109A	G	2W	3	8	Ceiling	9,670	9,670
27-110	G	2W	3	3	Ceiling	9,670	9,670
27-111	G	3W	3	8	Ceiling	15,161	15,161
27-112	G	3W	2	2	Ceiling	9,670	9,670
27-113	F	3W	9	1	Ceiling	10,288	10,288
27-114	F	2W	17	5	Ceiling	10,608	10,608
27-115	F	3W	13	15	Ceiling	10,608	10,608
27-116	F	2W	11	16	Ceiling	9,952	9,952
27-116A	F	2W	6	8	Ceiling	12,454	12,454
27-117	F	2W	1	9	Ceiling	9,670	9,670
27-118	F	2W	4	5	Ceiling	9,952	9,952
27-118A	F	2W	3	3	Ceiling	9,670	9,670
27-119	F	3W	3	8	Ceiling	9,670	9,670
27-120	F	3W	3	3	Ceiling	9,670	9,670
27-121	E	3W	8	2	Ceiling	9,670	9,670
27-122	E	3W	8	7	Ceiling	9,670	9,670
27-123	E	2W	8	2	Ceiling	9,670	9,670
27-124	E	2W	8	8	Ceiling	9,670	9,670
27-125	E	2W	6	16	Ceiling	9,336	9,336
27-126	E	2W	6	5	Ceiling	9,336	9,336
27-127	E	3W	5	15	Ceiling	9,336	9,336
27-128	E	3W	5	3	Ceiling	9,336	9,336
27-129	D	3W	16	3	Ceiling	9,336	9,336
27-130	D	3W	4	15	Ceiling	9,746	9,746
27-131	D	2W	15	5	Ceiling	18,410	18,410
27-132	D	2W	16	16	Ceiling	9,336	9,336
27-133	D	2W	5	17	Ceiling	9,336	9,336
27-134	D	2W	5	4	Ceiling	9,336	9,336
27-135	D	3W	5	16	Ceiling	9,336	9,336
27-136	D	3W	5	3	Ceiling	9,336	9,336

776027 Followup Survey Results

Location #	E/W Column letter	N/S Column Number	DistanceNorth (ft)	Distance East (ft)	Elevation	dpm/100cm2 PRE REMEDIATION	dpm/100cm2 POST REMEDIATION
27-137	C	3W	15	3	Ceiling	9,336	9,336
27-138	C	3W	15	15	Ceiling	9,336	9,336
27-139	C	2W	15	5	Ceiling	10,608	10,608
27-140	C	2W	14	17	Ceiling	10,608	10,608
27-141	C	2W	6	12	Ceiling	10,608	10,608
27-142	C	2W	6	3	Ceiling	10,608	10,608
27-143	C	3W	5	16	Ceiling	9,336	9,336
27-144	C	3W	5	5	Ceiling	9,336	9,336
27-145	B	3W	13	3	Ceiling	9,336	9,336
27-146	B	3W	13	16	Ceiling	9,336	9,336
27-147	B	2W	16	3	Ceiling	24,366	24,366
27-148	Duct Interference						
27-149	Duct Interference						
27-150	B	2W	5	5	Ceiling	34,112	34,112
27-151	B	3W	5	17	Ceiling	9,336	9,336
27-152	B	3W	5	2	Ceiling	9,336	9,336
27-153	A	3W	15	2	Ceiling	9,336	9,336
27-154	A	3W	15	15	Ceiling	9,336	9,336
27-155	A	2W	13	6	Ceiling	9,336	9,336
27-156	A	2W	19	16	Ceiling	9,336	9,336
27-157	A	2W	8	13	Ceiling	9,336	9,336
27-158	A	2W	7	4	Ceiling	9,336	9,336
27-159	A	3W	8	15	Ceiling	9,336	9,336
27-160	A	3W	4	3	Ceiling	9,336	9,336

Data and Sodium Iodide Instrument Information

Survey Area:	2nd Floor	Survey Unit:	776027	Survey Date(s):	11/09/04

Instrument Specifications

Instrument #	1	2
Meter Model:	Ludlum 2350-1	Ludlum 2350-1
Meter Serial #:	192614	192616
Detector Model:	Bicron G-5	Ludlum 44-17
Detector #:	B716T	19976S
Detector Size (cm^2):	125	17.8
Calibration Due Date:	12/10/04	7/30/05
Count Time (min)	5	5
Contact Efficiency	6.40%	8.00%

Ratio Used

Pu to Am - 241	8.1

Comments

In cases where the critical level is greater than the calculated dpm/100cm2, the critical level will be used for statistical analysis.

Count Times for backgrounds and samples are equal.

Attenuation Factors: Based on observation of Walls and Ceilings. Epoxy on Floor determined by chip sampling.

Background (Gross)

Instrument #	1	2
Gamma (Ceilings)	N/A	313
Gamma (Floors)	5000	N/A
Gamma (Block Walls)	N/A	311
Gamma (Solid Walls)	N/A	N/A

Background (cpm)

Instrument #	1	2
Gamma (Ceilings)	N/A	62.6
Gamma (Floors)	1000	N/A
Gamma (Block Walls)	N/A	62.2
Gamma (Metal Walls)	N/A	N/A

Efficiencies (cpm/dpm)

Instrument #	1	2
Thin/No Paint	0.064	0.080
Epoxy	0.052	0.065
Other	0.061	0.076

Coatings	Thickness (inches)
Thin/No Paint	0.007
Epoxy	0.250
Other	0.06

Total Activity Estimates Using Sodium Iodide Instruments

Survey Area:	2nd Floor	Survey Unit:	776027	Survey Date(s):	11/09/04

Sample Location #	RCT ID #	Instrument #	Gross Counts	Critical Level (dpm/cm2)	Total Alpha (dpm/cm2)
1	1	1	881	3,351	3,351
2	1	1	4958	3,351	3,351
3	1	2	370	4,710	6,524
4	1	2	410	4,695	11,330
5	1	2	325	4,695	4,695
6	1	1	4950	3,351	3,351
7	1	2	385	4,695	8,469
8	1	1	4,754	3,351	3,351
9	1	1	5163	3,351	3,351
10	1	1	4205	3,351	3,351
11	1	1	4421	3,351	3,351
12	1	1	5160	3,351	3,351
13	1	1	4,373	3,351	3,351
14	1	1	6777	3,351	36,201
15	1	1	5532	3,351	10,838
16	1	2	282	4,710	4,710
17	1	2	305	4,710	4,710
18	1	2	320	4,710	4,710
19	1	2	269	4,710	4,710
20	1	2	340	4,710	4,710
21	1	2	354	4,710	4,710
22	1	2	285	4,710	4,710
23	1	2	310	4,710	4,710
24	1	2	405	4,710	10,529
25	1	2	515	4,695	23,348
26	1	2	485	4,695	19,914
27	1	1	7634	3,351	53,660
28	1	1	6846	3,351	37,607
29	1	1	4805	3,351	3,351
30	1	1	5541	3,351	11,021

Sample Location Number	NaI Activity Measurements				
	Measurement Used	Comment	Surface	Coating	(dpm/100 cm^2)
1	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
2	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
3	Sodium Iodide	N/A	Ceiling	Thin/No Paint	6,523.6
4	Sodium Iodide	N/A	Wall	Thin/No Paint	11,330.5
5	Sodium Iodide	N/A	Wall	Thin/No Paint	4,695.4
6	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
7	Sodium Iodide	N/A	Wall	Thin/No Paint	8,469.2
8	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
9	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
10	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
11	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
12	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
13	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
14	Sodium Iodide	N/A	Floor	Thin/No Paint	36,200.9
15	Sodium Iodide	N/A	Floor	Thin/No Paint	10,837.9
16	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
17	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
18	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
19	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
20	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
21	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710.5
22	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710
23	Sodium Iodide	N/A	Ceiling	Thin/No Paint	4,710
24	Sodium Iodide	N/A	Ceiling	Thin/No Paint	10,529
25	Sodium Iodide	N/A	Wall	Thin/No Paint	23,347.6
26	Sodium Iodide	N/A	Wall	Thin/No Paint	19,914.1
27	Sodium Iodide	N/A	Floor	Thin/No Paint	53,659.7
28	Sodium Iodide	N/A	Floor	Thin/No Paint	37,606.6
29	Sodium Iodide	N/A	Floor	Thin/No Paint	3,351.2
30	Sodium Iodide	N/A	Floor	Thin/No Paint	11,021.2
				MIN	**3,351**
				MAX	**53,660**
				AVERAGE	**10,178**
				SD	**12,237**

776027
NaI Survey
All Data

Total Surface Activity

Survey Area:		2nd Floor	Survey Unit:		776027			
Meter Model:		NE Electra w/ DP6 Probe					Dates Counted:	11/9/04
Instrument #:		4394	n/a	n/a	n/a	n/a	A priori MDA:	94
Cal. Due Date:		1/7/05	n/a	n/a	n/a	n/a	Avg. Local Bkgd	3.6
Efficiency (c/d):		0.206	n/a	n/a	n/a	n/a	Avg. Efficiency	0.206
Sample Location #	RCT ID #	Inst. #	Instrument (cpm)		Local Bkgd (cpm)		(dpm/100 cm^2)	
1	1	1	36		5.0		150.5	
2	1	1	14		0.0		68.0	
3	1	1	9		1.0		38.8	
4	1	1	13		4.0		43.7	
5	1	1	8		3.0		24.3	
6	1	1	17		2.0		72.8	
7	1	1	13		5.0		38.8	
8	1	1	65		2.0		305.8	
9	1	1	8		2.0		29.1	
10	1	1	41		6.0		169.9	
11	1	1	23		11.0		58.3	
12	1	1	20		8.0		58.3	
13	1	1	14		6.0		38.8	
14	1	1	14		4.0		48.5	
15	1	1	33		2.0		150.5	
16	1	1	4		3.0		4.9	
17	1	1	5		4.0		4.9	
18	1	1	4		4.0		0.0	
19	1	1	9		3.0		29.1	
20	1	1	4		1.0		14.6	
21	1	1	2		1.0		4.9	
22	1	1	4		3.0		4.9	
23	1	1	7		4.0		14.6	
24	1	1	8		4.0		19.4	
25	1	1	9		6.0		14.6	
26	1	1	4		2.0		9.7	
27	1	1	11		5.0		29.1	
28	1	1	44		1.0		208.7	
29	1	1	32		0.0		155.3	
30	1	1	28		5.0		111.7	
						MIN	0.0	
						MAX	305.8	
						MEAN	64.1	
						SD	73.0	

Removable Activity

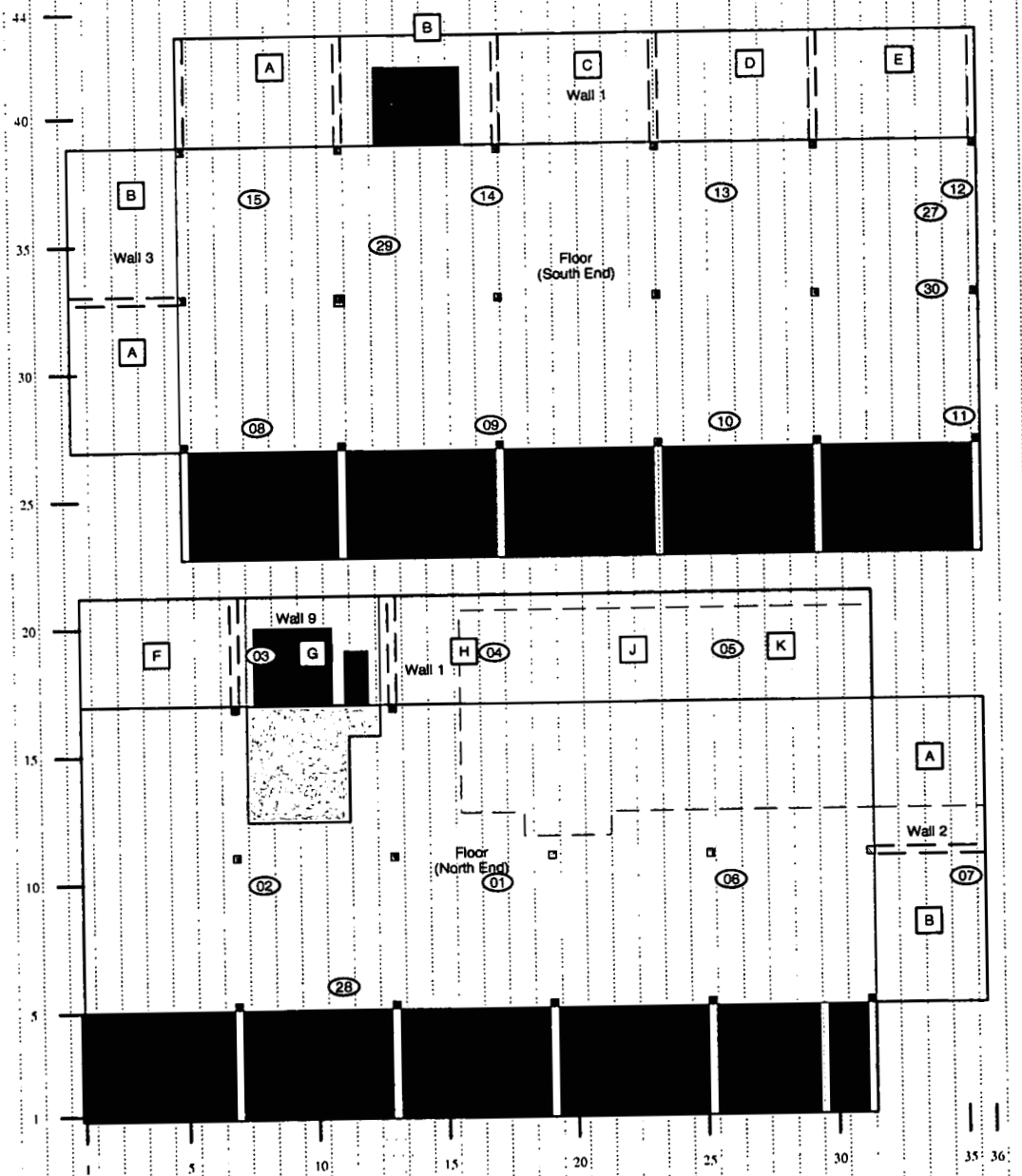
Survey Area:		2nd Floor	Survey Unit:		776027
Dates Counted:	11/9/04				
A priori MDA:	16				
Efficiency (c/d)	0.333				
Smear Location Number	Smear Results				
	RCT ID #	Serial Number	Gross (cpm)	Bkg.	(dpm/100 cm^2)
1	1	847	1	0.2	2
2	1	847	1	0.2	2
3	1	847	1	0.2	2
4	1	847	0	0.2	-1
5	1	847	2	0.2	5
6	1	847	0	0.2	-1
7	1	847	0	0.2	-1
8	1	847	4	0.2	11
9	1	847	1	0.2	2
10	1	847	1	0.2	2
11	1	847	0	0.2	-1
12	1	847	1	0.2	2
13	1	847	0	0.2	-1
14	1	847	0	0.2	-1
15	1	847	0	0.2	-1
16	1	847	0	0.2	-1
17	1	847	0	0.2	-1
18	1	847	1	0.2	2
19	1	847	0	0.2	-1
20	1	847	2	0.2	5
21	1	847	0	0.2	-1
22	1	847	0	0.2	-1
23	1	847	0	0.2	-1
24	1	847	0	0.2	-1
25	1	847	0	0.2	-1
26	1	847	0	0.2	-1
27	1	847	7	0.2	20
28	1	847	4	0.2	11
29	1	847	3	0.2	8
30	1	847	3	0.2	8
				MIN	**-0.6**
				MAX	**20.4**
				MEAN	**2.6**
				SD	**5.0**

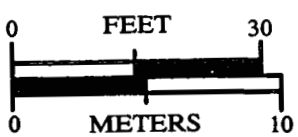
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 776 CLUSTER

Survey Area: 2nd Floor **Survey Unit:** 776027 **Classification:** NA
Building: 776
Survey Unit Description: Second floor

Total Floor Area: 746 sq. m **Total Area:** 2789 sq. m **Random Start Grid Size:** 9 x 9 sq. m

SURVEY UNIT 776027 - MAP 1 OF 2





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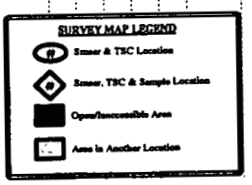
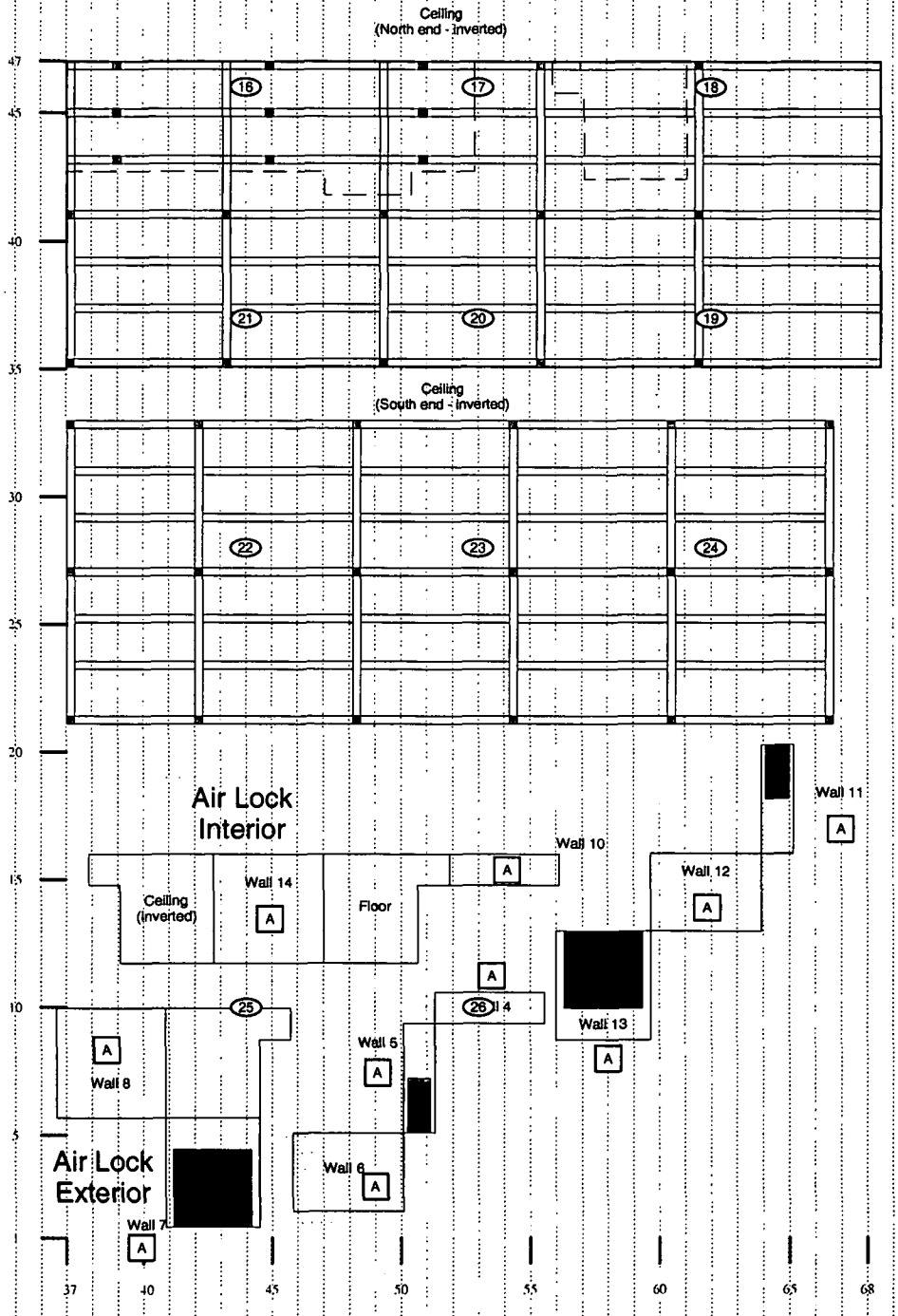


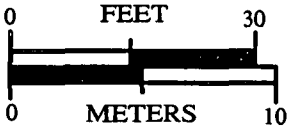
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 776 CLUSTER

Survey Area: 2nd Floor **Survey Unit: 776027** **Classification: NA**
Building: 776
Survey Unit Description: Second floor

Total Floor Area: 746 sq. m **Total Area: 2789 sq. m** **Random Start Grid Size: 9 x 9 sq. m**

SURVEY UNIT 776027 - MAP 2 OF 2



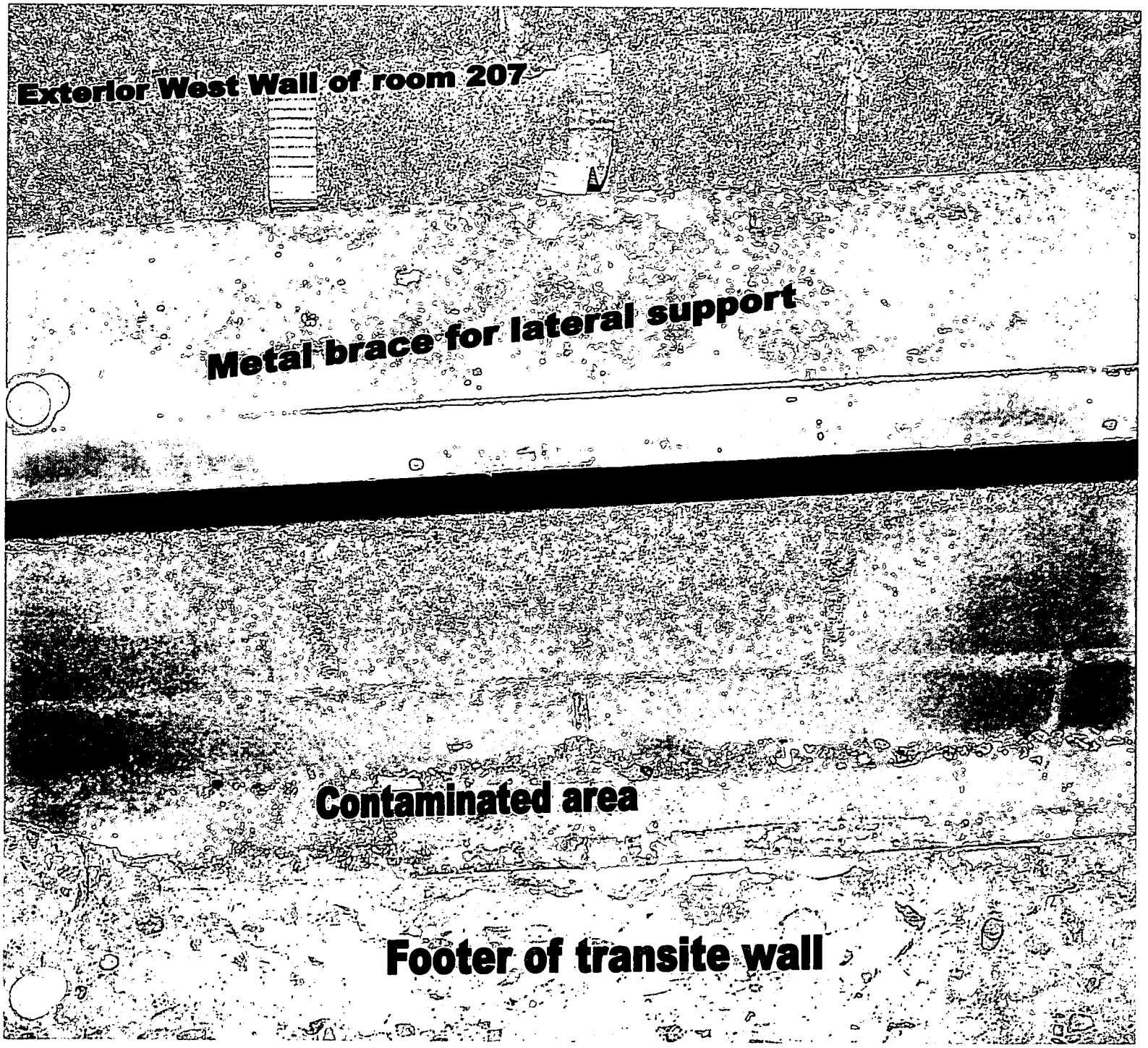


N

SURVEY MAP LEGEND
- Smear & TSC Location
- Smear, TSC & Sample Location
- Open/Inaccessible Area
- Area is Another Location

Contaminated Crack in Grid 27-51

Contaminated Area between Columns J-1 and G-1



Contaminated Crack in Grid 27-52